

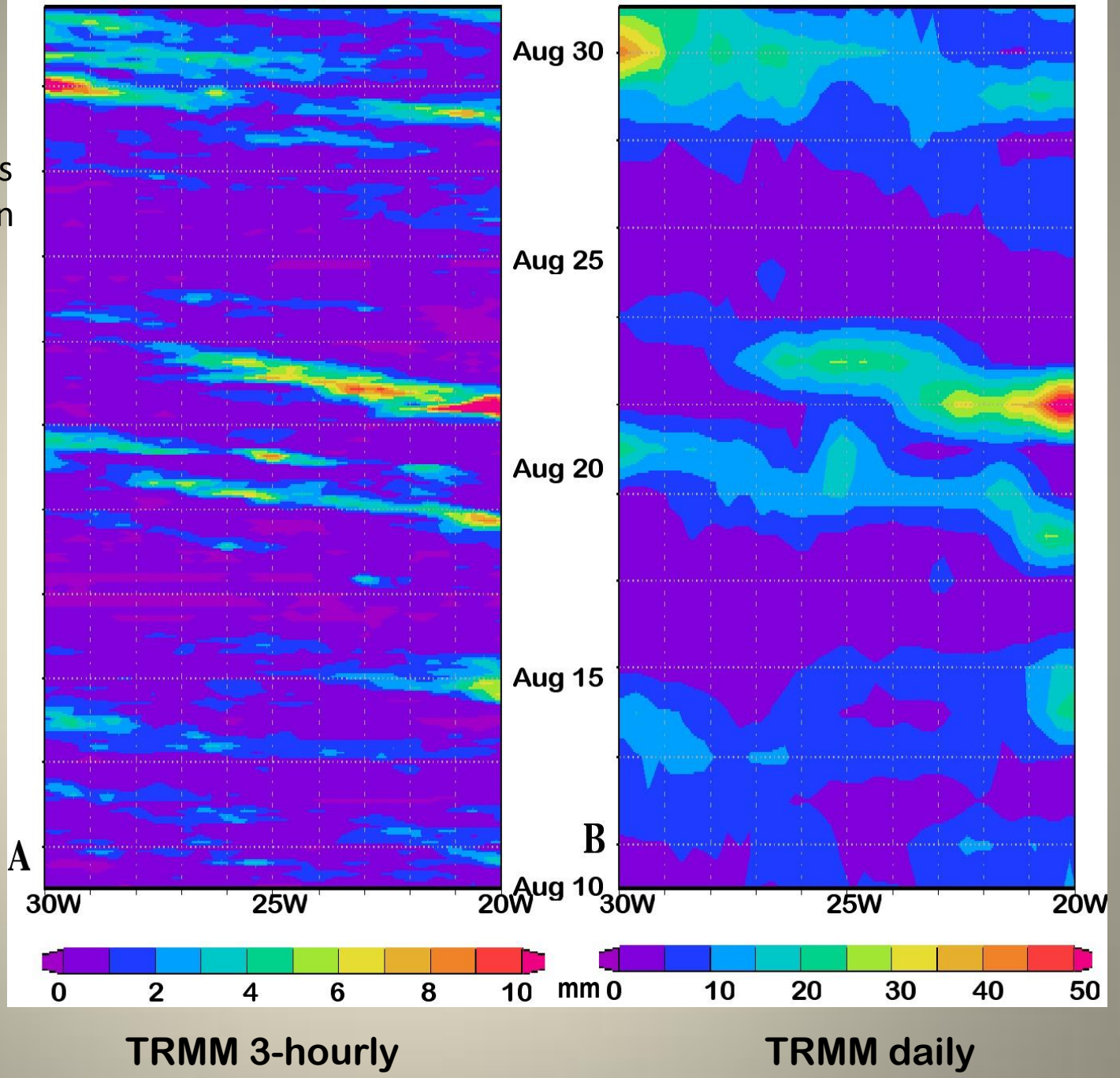
Propagation of Convective Complexes Monitored by Giovanni TRMM Imagery over the Eastern Tropical Atlantic

**Leonard M. Druyan and Matthew
Fulakeza**

**Center for Climate Systems Research,
Columbia University and the
NASA/Goddard Institute for Space
Studies, New York**

Precipitation swaths propagate westward as squall lines, perhaps associated with African easterly wave Disturbances.

3-hourly resolution shows one, two or three swaths per day.



TRMM daily

Imagery shows at least 5 swaths of heavy precipitation moving northward between 11 August-16 September.

Next slide takes a closer look at this interval.

Sep 16

Sep 11

Sep 6

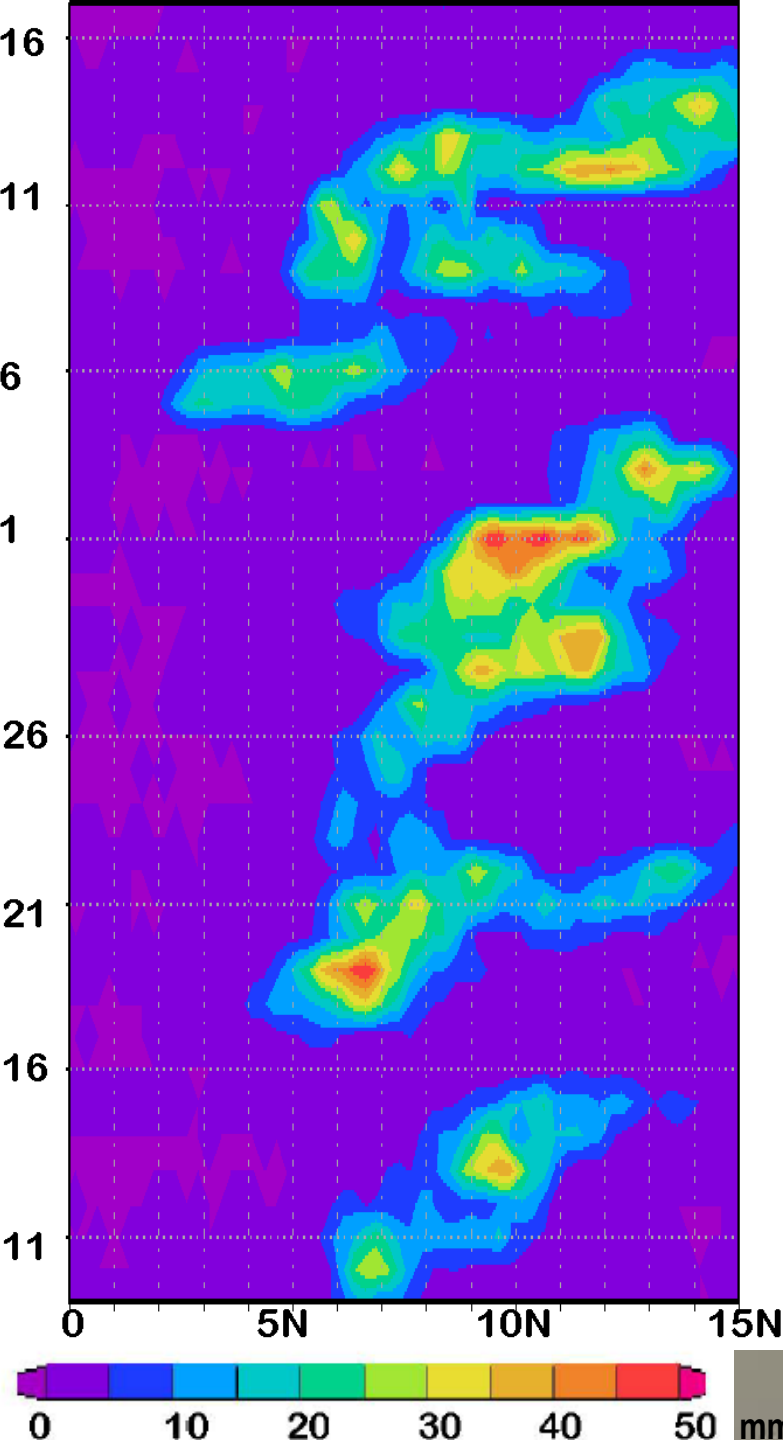
Sep 1

Aug 26

Aug 21

Aug 16

Aug 11

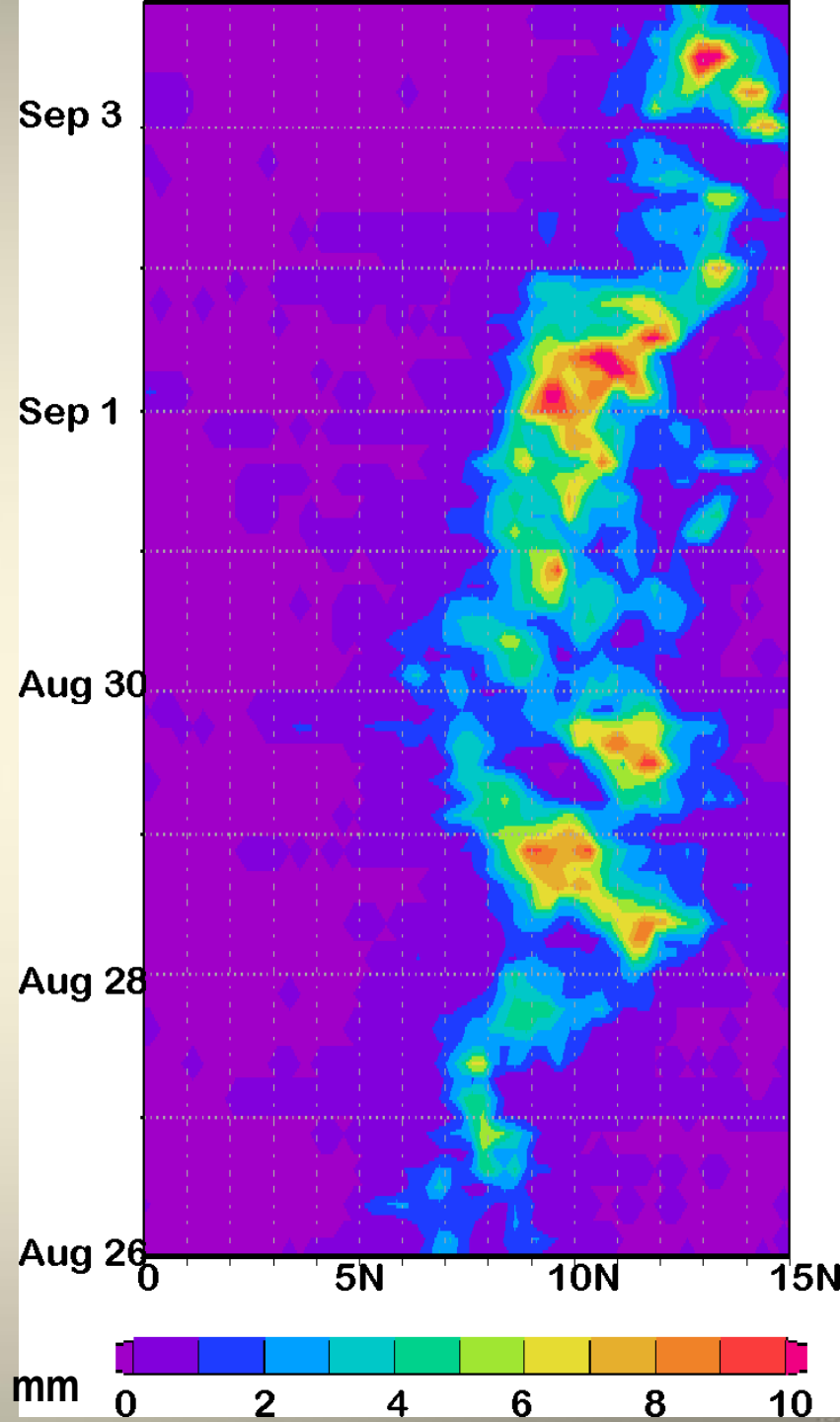


TRMM 3-hourly

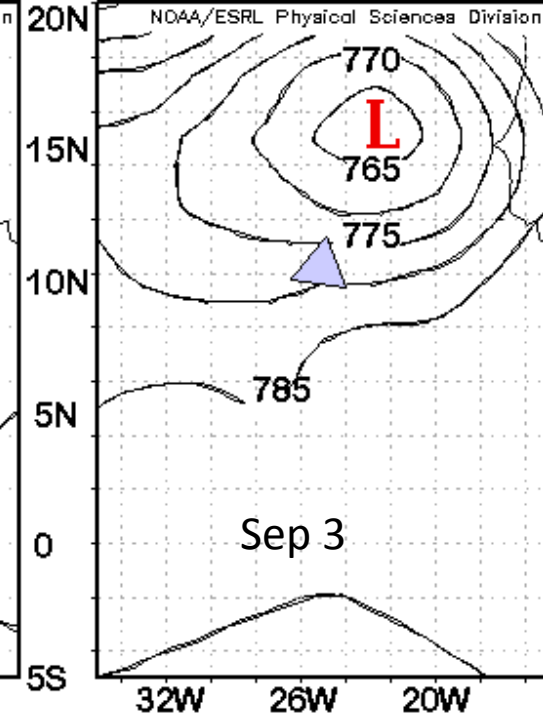
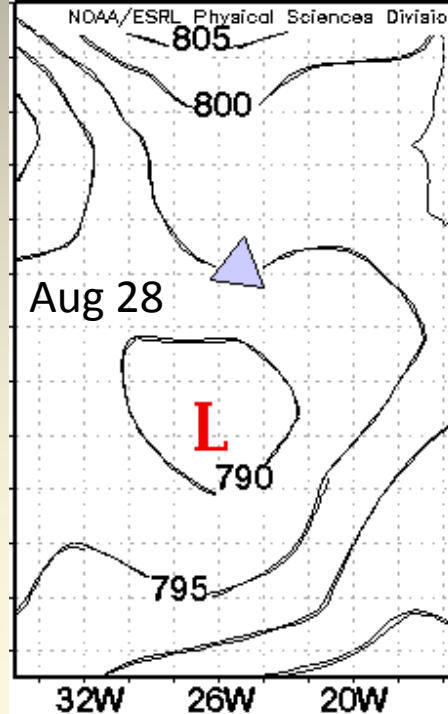
Although the envelope drifts northward,
Individual maxima propagate southward.

This behavior was most prevalent in 2006.

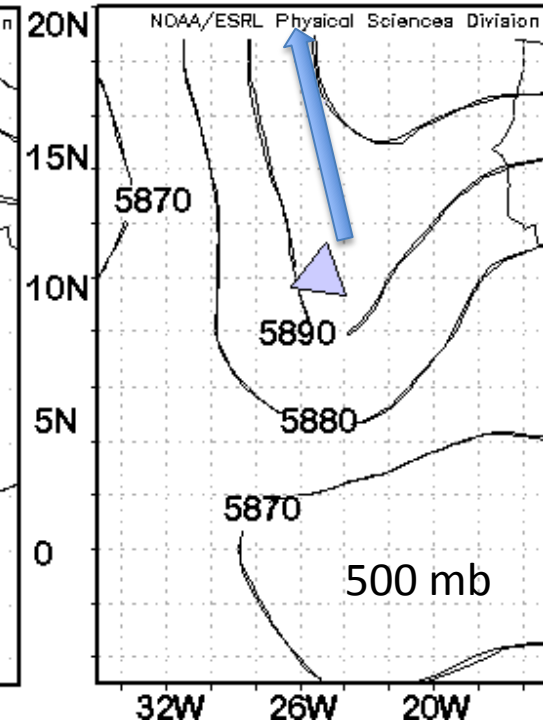
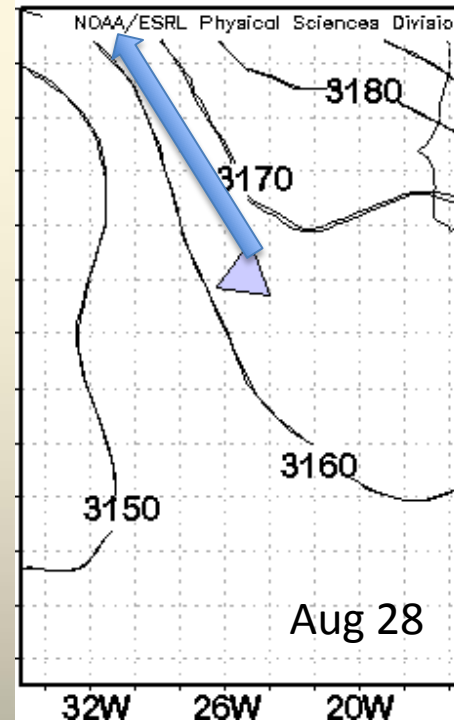
Examination of Giovanni TRMM imagery for
1998-2010 showed only isolated examples
of southwestward propagation of precipitation
maxima over the SE N. Atlantic in JJAS.



Near-surface



700 mb



Upper tropospheric steering toward the NW moved the ITCZ trough and the precipitation envelope toward the NW.

No synoptic (weather map) evidence
Can explain the SW propagation of
Individual precipitation centers.
Hypothesis: gust front propagation.

Conclusion

- TRMM imagery allowed detection of relatively rare meridional propagation of mesoscale convective complexes during the summer over the SE North Atlantic Ocean.
- Low-index (trough/ridge) circulation aloft steered ITCZ convective clouds to north, but individual cells moved toward the SW.
- Gust fronts under Tstms spawn new Tstms in the direction of downdraft outflow. Only 3-hourly resolution able to detect phenomenon.

Relevant publication

- Druyan L, Fulakeza M. (2012) Propagation of convective complexes observed by TRMM in the eastern tropical Atlantic. *The Open Atmospheric Science Journal*, **vol. 6**, 1-8.